CITY OF COLLEGE PARK

College Park ARTS Exchange

Bee City USA — Making The World Safer For Pollinators — One City At A Time — beecityusa.org

Instructions
Bee Hotel-building Workshop

June 25, 2022, DAVIS HALL

Hosted by the Bee City USA Committee and the College Park Arts Exchange

Photos courtesy of Craig R. Beatty

Introduction:

Building a bee hotel is one of the best ways to get to know some of your native pollinators. These bees are docile, do not sting, and can be quite colorful in both hue and personality.

Your bee hotel will attract cavity nesting bees, in College Park these will be mostly mason bees. However, there are many other species and you will also attract leaf-cutter bees, who like their rainforest ant cousins, cut out pieces of leaves to build their cavity nests.

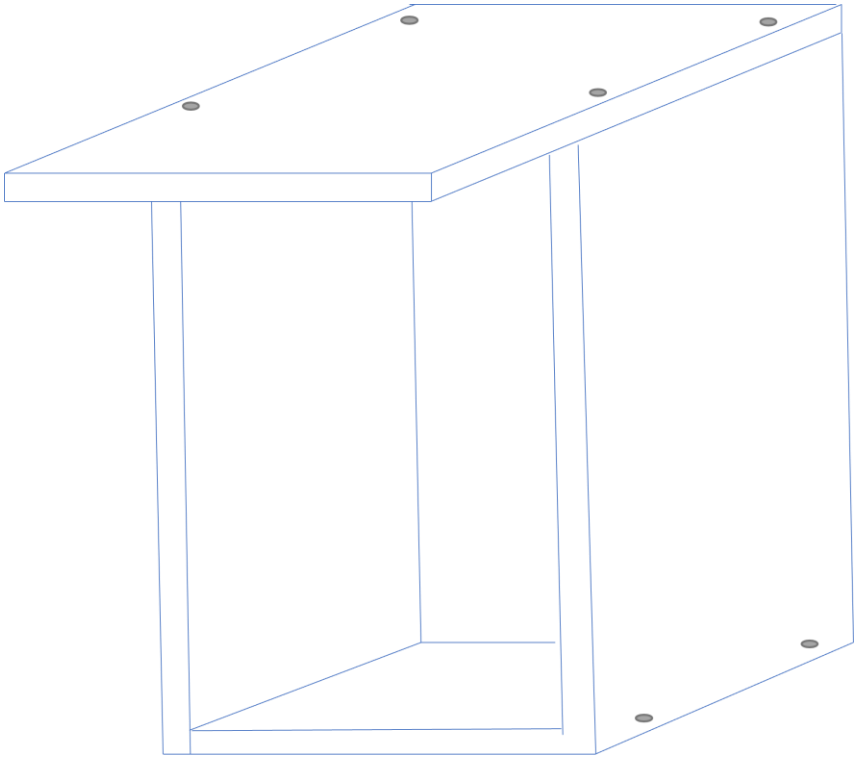
The bees forage on flowers within a few hundred yards of home and tend to emerge early in spring with the first wildflowers – lasting until the first frost of the season. Their larvae typically overwinter and develop in the sealed-of tunnels (shown below).

A mason bee cocoon. Photo Courtesy of Orangeaurochs red masonBee cocoon and nest cells in a bee hotel Flickr Creative Commons

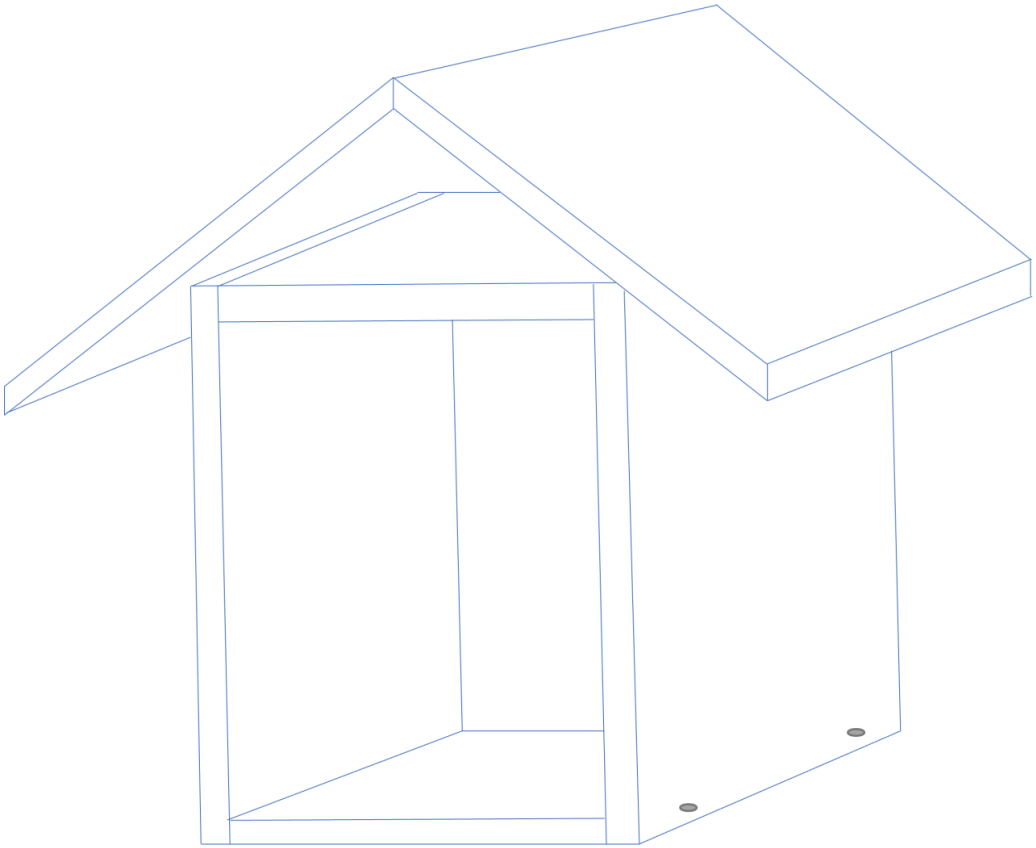
A male leaf-cutter bee (*Megachile willughbiella)* testing the morning air temperature Photo courtesy of Nigel Jones Flickr Creative Commons

The most important thing to remember about building a bee hotel is that it is supposed to be fun. It is the epitome of the phrase "*anything worth doing is worth doing poorly*". No matter how bad you are at using tools or constructing things, if your house has walls and a roof and some cavities for the bees to nest, and you place the hotel in a place that gets some sun, you will get to enjoy some cute little bees.

Two types of cavity nesting bee hotels prepared for this workshop



Beginner-level Bee Hotel



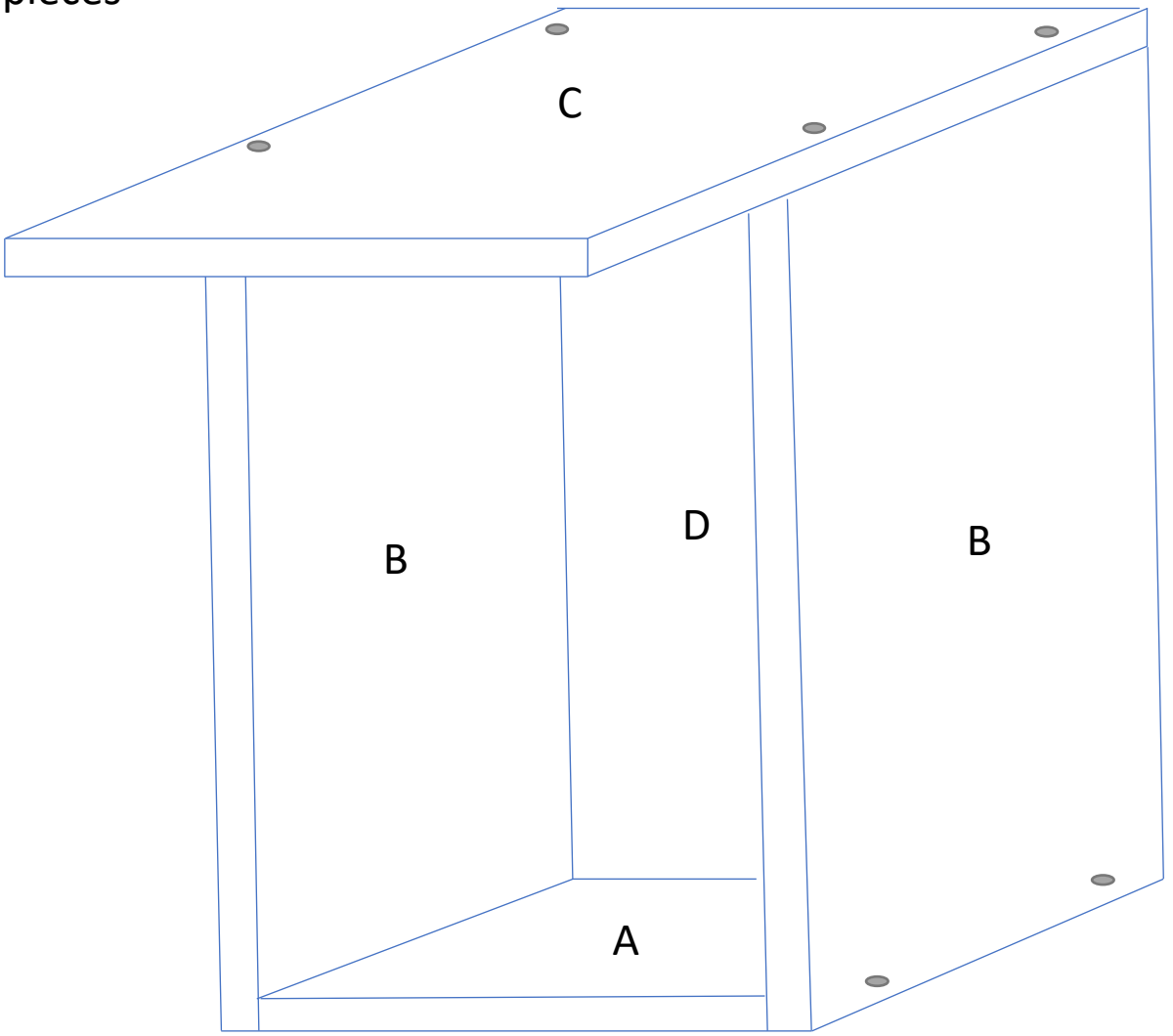
Intermediate-level Bee Hotel

Beginner-level Bee House Materials:

A: One (1) 8” inch long (0.75” x 9.5”) pieces
B: Two (2) 12” inch long (0.75” x 9.5”) pieces
C: One (1) 10” inch long (0.75” x 11.5”) pieces
D: One (1) 9.5” x 12” ¼” plywood piece

8 wood screws
8 finishing nails
Bottle wood glue
4 steel fasteners (for mounting)

Tools required:
Screwdriver/drill
Hammer



Note: there is a difference between the actual dimensions of lumber and the advertised dimensions. For example, an 8 foot board that is use to create the (0.75” x 9.5”) pieces will be labeled as a 1” x 10”. Similarly, the (0.75” x 11.5”) is a 1” x 12”

Beginner-level Bee House Assembly:

Step 1: Ensure you have all the pieces you need, 8 1.5”wood screws, 8 finishing nails, wood glue, paper towels and tools (hammer, screwdriver or drill)

Step 2: using the pre-drilled holes on the bottom of B1, and applying wood glue where the two pieces meet, use two wood screws to fasten B1 to A1.

Step 3: using the pre-drilled holes on the bottom of B2, and applying wood glue where the two pieces meet, use two wood screws to fasten B2 to A1/B1.

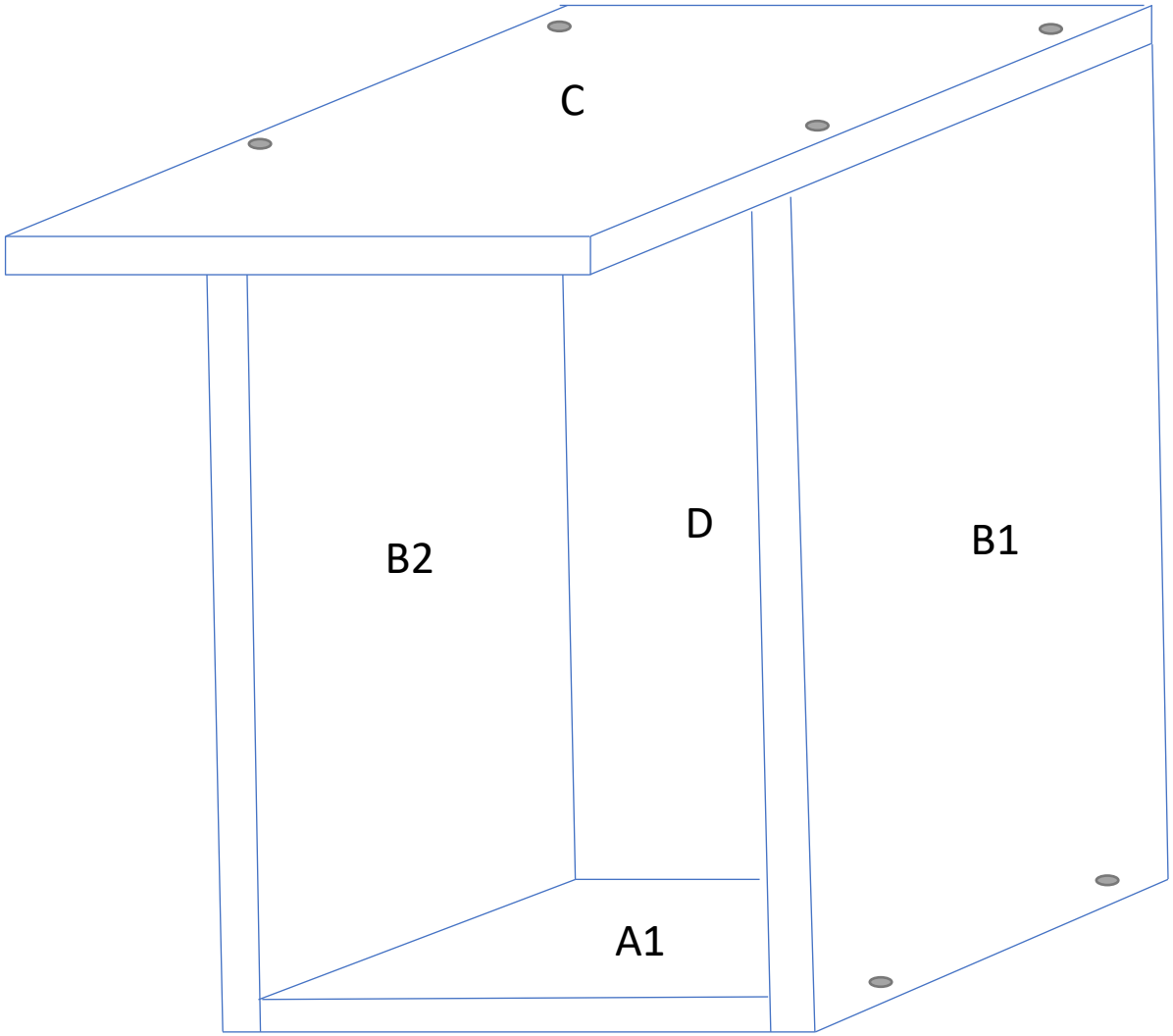
You should now have one piece that looks like a “U”

Step 4: pre-drill holes and fasten the A1/B1/B2 piece to the C piece, applying wood glue where the two pieces meet.

You should now have a BOX made of the A1/B1/B2/C pieces fastened together with 8 wood screws. There should be a 2” overhang from C that will protect the bees from rain.

Step 5: Hammer the D piece to the back of the bee hotel using the finishing nails, making an enclosed box.

Voila! Time to paint!

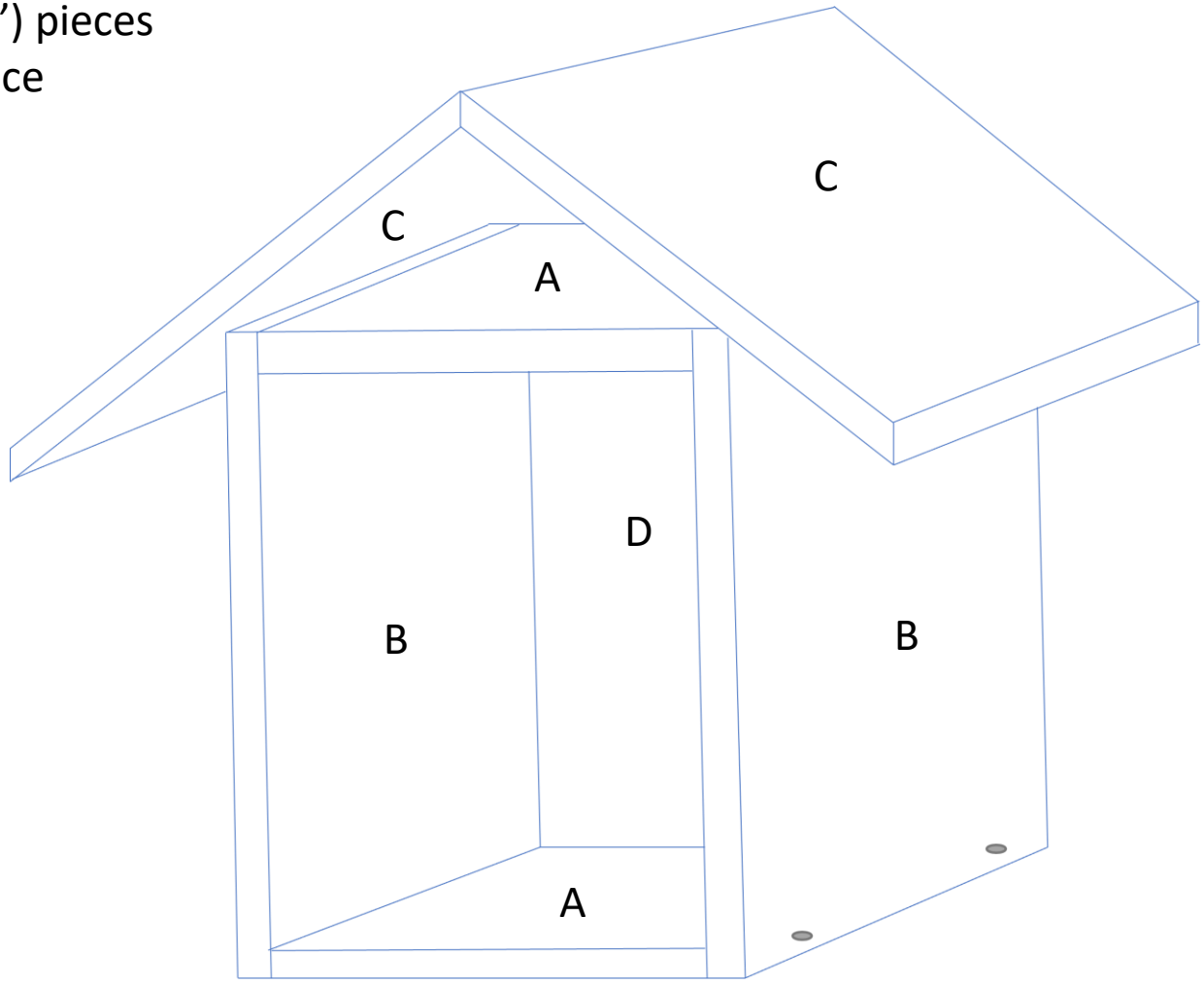


Intermediate-level Bee House Materials:

A: Two (2) 8” inch long (0.75” x 9.5”) pieces
B: Two (2) 12” inch long (0.75” x 9.5”) pieces
C: Two (2) 10” inch long (0.75” x 11.5”) pieces
D: One (1) 9.5” x 12”, ¼” plywood piece

12 x 1.5” wood screws
4 x 3” wood screws
8 finishing nails
Wood glue
4 steel fasteners

<u>Tools required:</u>
Screwdriver/drill
Hammer
Patience fastening a 45-degree roof



Note: there is a difference between the actual dimensions of lumber and the advertised dimensions. For example, an 8 foot board that is use to create the (0.75” x 9.5”) pieces will be labeled as a 1” x 10”. Similarly, the (0.75” x 11.5”) is a 1” x 12”

Intermediate-level Bee House Assembly:

Step 1: Ensure you have all the pieces you need, 8 wood screws, 8 finishing nails, wood glue, paper towels and tools (hammer, screwdriver or drill)

Step 2: using the pre-drilled holes on the bottom of B1, and applying wood glue where the two pieces meet, use two wood screws to fasten B1 to A1.

Step 3: using the pre-drilled holes on the top of B2, and applying wood glue where the two pieces meet, use two wood screws to fasten A2 to B2.

You should now have one piece that looks like an “L” and one piece that looks like a “⅂”

Step 4: using the pre-drilled holes, fasten the A1/B1 piece to the A2/B2 piece, applying wood glue where the two pieces meet.

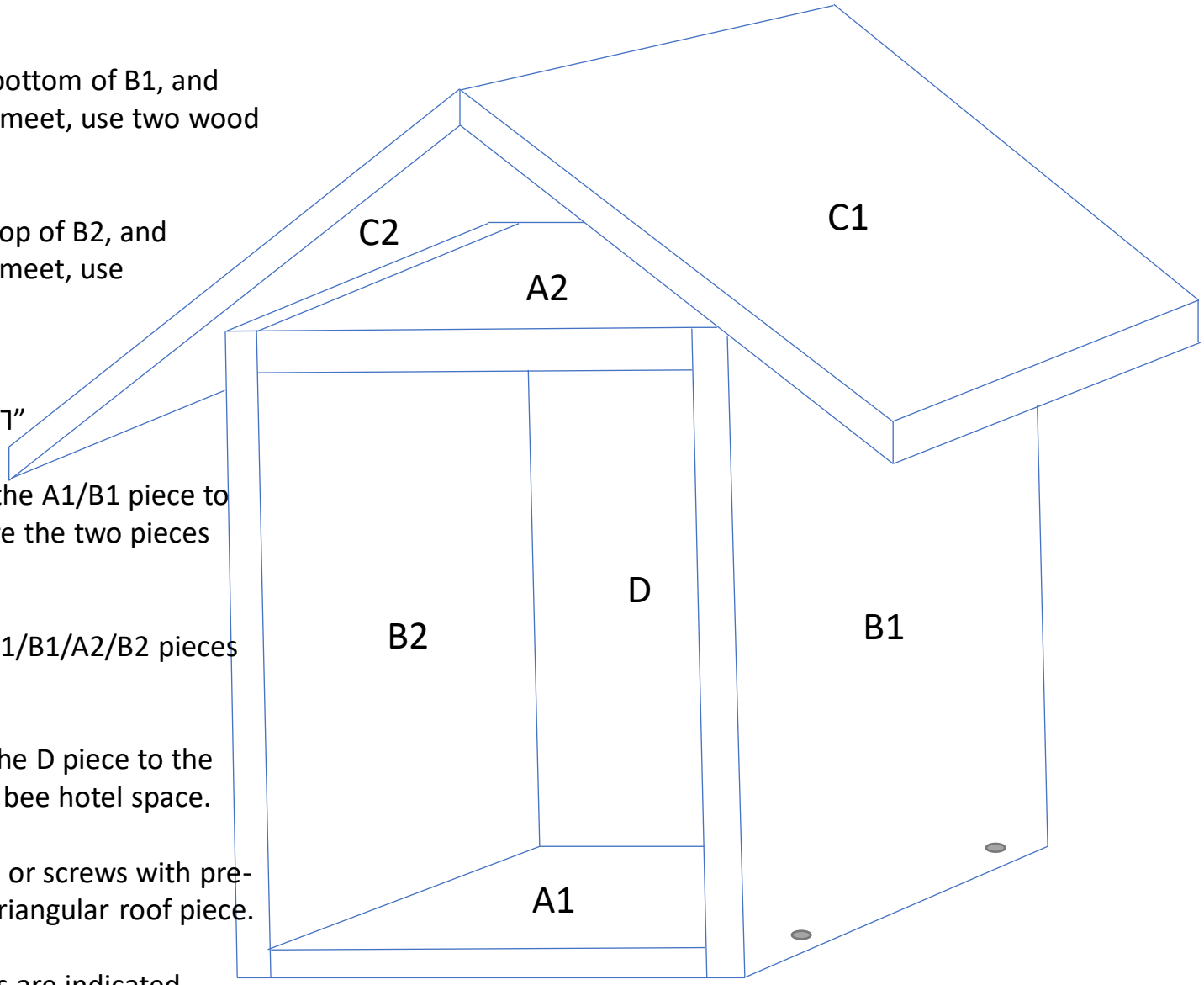
You should now have a BOX made of the A1/B1/A2/B2 pieces fastened together with 8 wood screws.

Step 5: using the finishing nails, hammer the D piece to the back of the open box frame, enclosing the bee hotel space.

Step 6: using wood glue and finishing nails or screws with pre-drilled holes, attach C1 and C2 to make a triangular roof piece.

Step 7: Pre-drill holes where the red circles are indicated, going through the roof into the wood of the box below. Use long screws to attach the roof to the main body of the bee hotel. Duplicate on the other side of the roof piece.

Voila! Time to paint!



(A1+B1)+ (A2+B2) + (C1+C2) + D

Customization:

The main reason to paint your bee house is to deter carpenter bees from destroying it. Given the opportunity a carpenter bee would definitely use the frame of your bee house to make some tunnels and lay some eggs. Usually, to deter them people use pressure-treated wood, but this has chemicals in it that are not good for pollinators and so we use untreated wood for bee hotels.

You can paint the entire outside of your bee house however you'd like. Bright colors are good because they attract bees and act as a good homing signal to let them know where "home" is. Cover it with color and deter those carpenter bees from making swiss cheese of your bee hotel.

It is important, however, NOT to paint the inside of the bee house since paint does often include chemicals that might deter bees from making a home in your newly constructed bee hotel.

Photos courtesy of Craig R. Beatty

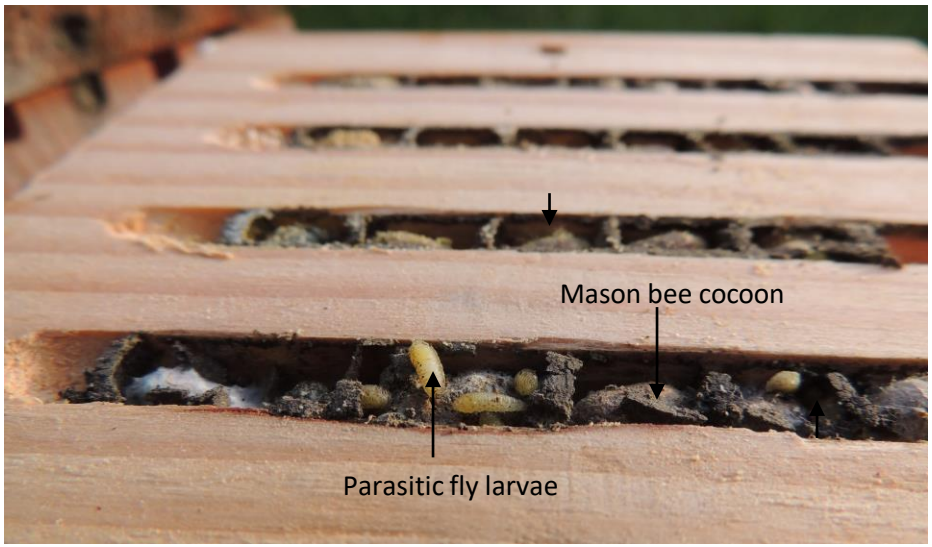
Installation: nesting locations and materials

The hotel you've made for your bees is the perfect size. Now we just fill it with all the things that will bring the bees to the yard. MOSTLY, this means finding things to make tunnels and paying attention to what's flowering when.

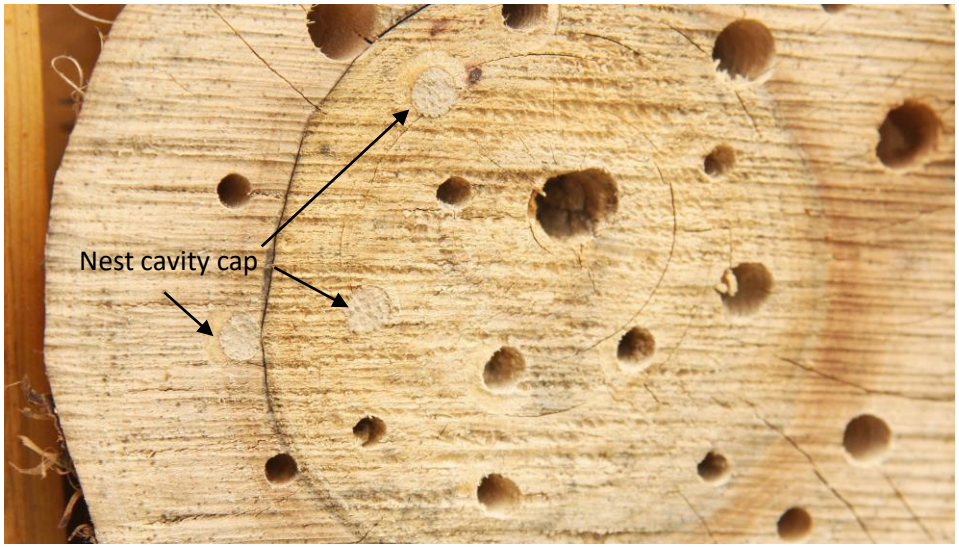
You're welcome to purchase cardboard tubes from garden supply stores, use paper straws, bamboo tubes or anything else. In nature, these bees typically use small holes that are made by beetles and other creatures in trees and downed logs. They are cavity nesting bees so wherever you make good cavities, they will find them and use them.

One of the best ways to make your bees feel at home is to fill your bee hotel with 4-5" diameter logs cut to about 8" long. Using some long drill bits of different sizes up to about 5/8" but not much bigger. Drill some holes lengthwise in these logs to a depth greater than 6" and open on only one end. This depth ensures that both male and female bees will emerge – if the cavities are less than 6" then no female bees may develop and only males will emerge. You can also use blocks of wood, they'll tend to stack better than round logs, but the bees like the strange spaces created by a bunch of uneven logs.

Fill the rest of your bee hotel with good nest building materials: dried grass, pine needles, pinecones, and place a small water dish containing some clay on the floor of your bee hotel. In addition to the cavities, it's very important that the bees have access to other nest building materials and a water source. As it evaporates, just replenish the water/clay mixture as you notice it's dry



A mason bee cocoon and parasitic fly larvae. Photo Courtesy of Orangeaurochs Flickr Creative Commons



Drilling holes of different diameters will increase the likelihood that you'll attract different bee species. Mason bees tend to be smallest, while leaf-cutter bees are larger. Photo courtesy of Maja Dumat Flickr Creative Commons

Installation: nesting locations and materials:

The placement of your bee hotel will determine how active it is. It's great if you can place it on a post and put it anywhere, but that's not always an option. Ideally the front of the hotel should see the morning sun but it's not necessary. What you want to avoid is putting it in a dark, moist area that sees very little sunshine.

It's also important to raise the bee hotel up off the ground and to secure it to something that will not move around in the wind. Screwed to a post or a fence 4-8 feet off the ground with plenty of sunshine and you should start to see some native bees in no time at all.

It is also important that there is a decent roof that keeps the cavities from filling with water. This is why both houses in this guide have roofs with at least a 2" overhang.

A bee hotel with many different materials and cavity diameters. This example is well secured to a post but could use more of an overhang to keep the rain out. Photo courtesy of Friends of Aldinga Scrub Flickr Creative Commons

A leaf cutter bee approaches a bee hotel carrying a leaf. Notice that the hotel is fastened to the base well with a wing-nut screw and there is a nice overhang above the cavity entrances. Photo courtesy of marc Flickr Creative Commons

Maintenance:

Bee hotels do not require much maintenance, but they do require some to keep the bees healthy:

1) Try to keep a water source close and always holding a bit of water; bees get thirsty too.
2) Do not drill too many cavity holes, you want to make a nice boutique hotel not a 1000-unit monster hotel. The more cavities you have, the more bees you'll get, but you'll also attract more bee parasites, who can cause lots of pain for your native bee friends.
3) In autumn, if you want to see which bees emerge in the spring, you can take the medium into which you've drilled holes, and the ones that have been "capped" by the bees and place it in a cardboard box in a shed. This isn't necessary but it can be fun to see which bees emerge in the spring. Alternatively, when the redbuds start to bloom again in the spring you can see which "capped" cavities have little holes chewed through them.
4) If you'd like to deter woodpeckers and birds from potentially feasting on your bee cocoons you can place some wire mesh on the front of your bee house. It keeps squirrels from making a cozy home for themselves too.
5) In the spring, once the bees have emerged, find a wood pile or a campfire for those old logs and drill some new holes in new logs.
6) It is also helpful to scorch then freshly cut ends of the logs with fire – it makes it easier for the bees to see where the holes are.
7) Also take care not to use nesting materials that have a lot of splintered ends, where the bees would enter the cavity, they have delicate wings that can get torn on poorly cut bamboo or milkweed stems. Sand the ends of the tubes if you're making them yourself.

A pugnacious leaf-cutter bee. Photo courtesy of Craig R. Beatty

Holes drilled in an old branch ~5" diameter. Try to use more than one drill bit size, more variety in size means different bee species. Photo courtesy of Craig R. Beatty